Not just data, but insights

The indicators presented in our analytical reports are based on data on publications and citations, article-level usage and readership, and macroeconomic trends. These are derived from high quality sources such as Scopus®, ScienceDirect®, Mendeley®, LexisNexis Patent®, your institution’s own data, and external sources.

The Analytical Services team adds value through the careful analysis and creation of reports that present data-driven key findings. The resulting insights answer pressing research management questions and inform decisions related to funding allocations, research policies, and strategies.

This Analytical Services Catalog provides an overview of reports that are currently available, their standard specifications, and options for customization (see Section 3). To provide the best solution for each customer, and provide the most appropriate analysis, we take a consultative approach to understand your goals and interests. Please consult your local Elsevier sales team or contact us via elsevier.com/research-intelligence to discuss how we can meet your specific needs.
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1. Standard Analyses

What are the most widely-accepted and used measures of research performance? Standard analyses provide key metrics along multiple dimensions to showcase your strengths and identify areas for improvement. They can be divided into three groups.

The first group measures the output and impact of scientific publications to create an overview of an entity’s strengths and weaknesses. It is an essential part of performance evaluation.

The second group focuses on collaboration amongst researchers. Are they co-authoring publications with others? If so, are these collaborators geographically close, or do these networks span the entire globe? This analysis further highlights which collaborations are the most beneficial to an entity and its partners.

The third group, using article usage and readership data, investigates the larger transfer of knowledge from research, particularly to the corporate sector. Furthermore, the analyses track the collaboration and researcher mobility between the corporate sector and academia.

Standard specifications for the analyses presented in Section 1 (Unless otherwise specified):

**Deliverable formats**
- A written report in pdf, with text and commentary (AND/OR)
- An Excel spreadsheet, with annotations and visualizations (AND/OR)
- A PowerPoint presentation, with notes and commentary

**Time period**
5 most recent years of Scopus data (2010-2014)

**Peers**
4 selected institutions

**Benchmark**
1 (either global or regional)

**Subject areas**
27 Scopus subject areas

**Delivery**
20 days after signature

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1.1 Output, Growth, & Impact

These analyses provide an overview of your institution's scientific performance. Identify your strengths, weaknesses, and performance relative to peers.

- How does your publication output, growth, and citation impact compare to the rest of the world and to selected peers?
- Which subject fields show remarkably high output and/or exceptionally high citation impact?
- Which subject areas have the strongest growth?

This report benchmarks your performance against the world or a relevant region, and selected comparators for any of the following metrics:

- Output metrics include the absolute number of publications, the relative article share, and the Compound Annual Growth Rate (CAGR).
- The most important impact metric used in this report is field-weighted citation impact. One of the most sophisticated indicators in the modern research metrics toolkit, this indicator of citation impact allows one to compare the impact of articles across different document types (article, review or conference proceeding paper), publication years, and subject fields.
1.2 Collaboration: Building and Improving Partnerships

This report analyzes the extent of your institution’s collaboration and the effects of different types of collaboration on citation impact.

- In what areas does your institution collaborate the most internationally? How much is that as a percentage of your institution’s total output?
- Who are your top 20 most prolific collaboration partners and what are the effects of these collaborations on each partner’s citation impact?

Research collaboration is significantly and positively associated with the citation impact of the resulting publications. Collaborating on a study can increase the overall performance of your institution as well as its visibility across borders. Therefore understanding current collaboration patterns is crucial to maximizing the benefits of collaboration.

This report provides a high level overview of the different types of collaboration in which your institution currently engages, and then a closer look at the actual collaboration partners. The analyses informs which collaborations are beneficial to the target institution and the collaboration partner, which are beneficial to neither, and which are beneficial to only one of them.

We distinguish between the following types of authorship:
- Single author publications: no collaboration
- Institutional collaboration: all authors are from the same institution
- National collaboration: authors are from different institutions, but within the same country
- International collaboration: at least one author is from an institution of a different country

Non-standard specifications for this analysis

Regional collaboration
Explore collaboration among authors from multiple countries in the region (e.g., Europe, Middle East, Africa).

Collaboration network
Analyze a network map to show which countries/institutions/researchers are collaborating closely among each other.

Field-weighted internationalization score
Normalize collaboration rates by field average to enhance comparison of the internationalization of institutions with different subject fociuses.

Recommended Recurrence/Update
Annual update for up to 2 years (e.g., 3-year contract)

Collaboration entities
If reporting on an institution, we can also look at top collaborating regions or countries with that institution, and vice versa for reports on regions and countries. For example, which countries collaborate the most with Harvard University, or which US universities in the Midwest collaborate the most with institutions in Ontario?
1.3 Knowledge Exchange: Economic Development

These analyses combines different perspectives of knowledge transfer between the academic and industry sector.

Economic development, as analyzed in this report, is characterized by knowledge exchange: a two-way transfer of ideas and information between academia and industry. Since knowledge resides with people and not in documents, much knowledge is tacit or difficult to articulate. Acknowledging these limitations, our analyses focus on indicators of explicit (codified and transferable) academic-industry knowledge exchange such as co-authored publications, citations to academic research in patents, cross-sector article downloads and researcher mobility.

The aim is to provide academic institutions with insights in the usage and readership of their output by particular industry, the impact of their collaboration with corporate institutions, and whether their research has led to innovation.

Institutions can use insights and findings from this report to find industry partners to fund mutually beneficial projects, or commercialize academic research.

A Knowledge Exchange report includes the following analyses:

- Cross-sector co-authorship
- Cross-sector researcher mobility
- Research usage: Patent citations
- Research usage: Downloads by sector (i.e., academic, corporate, government and medical)
- Research usage: Mendeley readership

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Recommended Recurrence/Update

Annual update for up to 2 years (e.g., 3-year contract)
2. Beyond the standard reports

The analyses presented in this section are our latest efforts to innovate and adapt to our clients’ needs. They feature novel methods of analysis (such as Fingerprinting) or target entities (metropolitan areas).

2.1 City and Region Report

While standard analyses or reports tend to focus on an institution, in some situations it may be insightful to widen or narrow the scope to a particular region.

Cities around the world compete to attract talent, jobs, and investment. How well they define and communicate their competitive advantages will determine whether the future is one of growth and prosperity or one of decline and difficulty. The City and Region report explores how a city or region is building its future on a foundation of research and innovation to create a sustainable knowledge economy and identifies its strength for attracting investment.

Cities/regions and comparator areas can be defined using existing statistical classifications, such as metropolitan statistical area (US) or census metropolitan area (CA), or include all institutions within an X-mile radius of a city center.

A City and Region report includes the following analyses:
- Output & Impact, overall, by subject, and by sector
- Cross-sector collaboration, overall and breakdown by within-city area versus outside-city area
- Academic collaboration, including a percentage of intra-city area collaboration versus other types of collaboration
- Research usage: Patent citations and downloads of publications

**Recommended Recurrence/Update**

Annual update for up to 2 years (e.g., 3-year contract)

This figure is a network graph of top corporate collaborators for Amsterdam and ten other European cities. Reference: Mapping Research and Innovation: Understanding Amsterdam’s Competitive Advantage 2015. Data Source: Scopus®
2.2 Research Area Report

This report provides an in-depth view on an institution's performance in one or more specific research areas.

There are often strategic reasons to investigate an institution's performance on one or more research areas in greater detail. Such areas may play an essential role in guiding an institution’s research strategy, attract great interest from academic and research funding communities (such as for responding to a research grant application or renewal), and or influence the development of other research areas.

Elsevier employs several methods to define research areas, ranging from using pre-defined journal categories to searching for keywords, and to applying our sophisticated semantic Fingerprint technique. The best way depends on the features of the research areas and the available inputs for the study.

This report covers the following standard analyses:

- Output, Growth, & Impact,
- Collaboration,
- Knowledge transfer,

and can be naturally combined with the report Emerging Topics (see Section 2.3).

Non-standard specifications for this analysis

Outward focus: Coverage of publications of these research areas across journal categories.

Wider academic impact of research: Extent to which the research in these particular areas are citing or being cited by publications from other research fields.

Recommended Recurrence/Update

Annual update for up to 2 years (e.g., 3-year contract)

The world map depicts top corporate institutions collaborating with the selected comparator countries in one research area. Reference: Brain Science: Mapping the Landscape of Brain and Neuroscience Research 2014.

This figure shows the field-weighted citation impact and compound annual growth rate in a research area and its sub-themes. Reference: Stem Cell Research: Trends and Perspectives on the Evolving International Landscape 2013.
2.3 Emerging Topics

Science is a dynamic enterprise, and in order for researchers and institutions to stay at the forefront, they need insights on the newest emerging trends.

For example, prior to 1999 and the full sequencing of the human genome, whole areas of study such as genomics and epigenetics did not exist. Today, they are amongst the largest growing subfields in biology.

This report helps identify, for a given discipline (e.g. Mathematics, Agriculture, etc.), emerging trends and trendsetters.

- What are the top clusters of keywords being downloaded?
- What are the top clusters being cited?
- Which institutions and researchers are publishing the most articles related to these trends?

Combining the power of the Elsevier Fingerprint Engine, ScienceDirect usage and readership data, and Scopus citation data, we identify the top keywords and concepts in a given discipline for the most recent years. Through analyzing this data, the report provides more granular details on both the source of and the audiences for these top trends.

Recommended Recurrence/Update

Annual update for up to 2 years (e.g., 3-year contract)
2.4 Inter-disciplinary Research Report

This report addresses an important topic in the research landscape by investigating to what extent research is inter-disciplinary and how it affects the impact of research.

Collaboration across multiple research areas is a growing trend in research. By gathering and integrating knowledge from different disciplines, collaboration is believed to increase the citation impact of the research and stimulate the generation of breakthroughs in research.

We use a novel method to define inter-disciplinary research. The method relies on the central principle that if an article is cited by or references articles that are relatively 'far' from the article itself, it is an indication of interdisciplinarity. If an article is cited by or references articles that are relatively 'close' to the article itself, this is indication of mono-disciplinarity.

In this way, the method does not rely on pre-defined subject areas. It also takes into consideration that the research landscape is dynamic: what is considered inter-disciplinary today may be disciplinary tomorrow.

This report covers the following topics:
- Output, Growth, and Impact in inter-disciplinary research
- Collaboration in inter-disciplinary research

Non-standard specifications for this analysis
- Knowledge exchange in inter-disciplinary research
- Top institutions conducting inter-disciplinary research
- Main subject areas of the authors involved in inter-disciplinary research (e.g., whether physicists frequently collaborate with chemists in inter-disciplinary research)

Recommended Recurrence/Update
- Annual update for up to 2 years (e.g., 3-year contract)

The figure shows the percentage of country’s total publications that belong to world top 10% most inter-disciplinary research.
2.5 Department Performance Analysis

Institutions may need to obtain a deep understanding of their department or faculty’s research performance at different levels by analyzing their research output, impact, and growth at different levels of aggregation.

This report is structured to provide a comprehensive view of the research performance of a department in its area of focus by incorporating a wide range of indicators. Beyond department-level metrics, the report also analyses the performance of individual researchers in the department, providing the department’s state of research from a human capital perspective.

Departments’ research are typically highly focused in a particular field, hence the department can define their research area by making a selection of Scopus subject areas in which peer institutions can be compared against. In addition to quantitative analysis of research output, impact and excellence, a high-level comparison of competency maps can show the different research focus between the department and its peer institutions, in that particular field.

The author profiles of researchers in the department can be refined through the Profile Refinement Service. The resulting publication lists will allow for the generation of accurate author-level metrics such as publication output, h-index, field-weighted citation impact, number of highly-cited articles, and more. We encourage the department to augment the author metrics we generate with additional information such as the researcher’s job rank or cohort so that we can provide the distribution analysis of the age group of researchers versus their research output and impact.

Non-standard specifications for this analysis
- Research area definition by journal selection
- Research area definition by keyword searches
- Author Profile Refinement Service

Institutions may need to obtain a deep understanding of their department or faculty’s research performance at different levels by analyzing their research output, impact, and growth at different levels of aggregation.
2.6 Faculty Recruitment and Retention Report

Star faculty and researchers drive institutional success, and the competition for the next top talent is intense. Gathering information about which researchers to recruit and which to retain or promote is difficult. Our reports provide valuable insights to assist those processes.

This report assists universities with faculty recruitment and retention decisions by providing (a) discovery of potential candidates and/or (b) evaluation of existing candidates along several dimensions of research performance.

Enriching the talent pool

For institutions recruiting for new positions, this report provides a customizable list of up to 100 researchers (from around the world or from within a designated geographic region/country) that otherwise perform strongly along multiple dimensions of research performance. This would consist of standard analyses at the individual-researcher level detailing:

- Output, impact, growth, and research excellence
- Publications per year (since year of first publication)
- h-indices and other derivatives (m-index, g-index)

Non-standard specifications for this analysis
- Calculations of researchers’ level of inter-disciplinarity

Evaluating candidates and making better matches / promotions

For institutions with an existing list of candidates, this report provides more in-depth analyses that compare candidates along several dimensions. In addition to the analyses listed above, this report provide standard reporting on:

- Benchmarking researchers’ performance to one another as well as institution or research area as a whole
- Most frequent and impactful collaborators
- Percentage of researchers’ collaborations with other researchers at an institution (focus on institutional fit) or with international researchers (focus on external/international orientation)
- Percentage of researchers’ collaborations with corporations or other non-academic institutions and patent citations of researchers’ publications (focus on knowledge transfer/cross-sector orientation)

Non-standard specifications for this analysis
- Reporting on overall number of publications and publications in which researcher is first and/or last author
- If boundaries of researcher network can be defined, additional social network analysis dimensions (centrality, closure, etc.)

2.7 Gender in Research Report

This report investigates research performance from gender perspectives to help design strategies on gender in research.

According to the US Department of Education’s National Center for Education Statistics (NCES), women make up 45.4% of all faculty but only 34.7% of tenured faculty. Within certain disciplines, the percentage of female professors, PhD recipients, and enrolled students (those who comprise the pipeline of future researchers) is even lower. Yet, a diversity of gender perspectives in research strengthens the quality of knowledge production, the relevance of research, and the ability to society to innovate.

This report provides contextual information on an entity’s research performance from gender perspectives by answering essential questions such as:

- What is the gender ratio among researchers? What percentage of an entity’s publications is co-authored by female researchers?
- How does an entity’s female researchers compare to their male counterparts in terms of research productivity, seniority, and citation impact?
- How, if at all, do female and male researchers differ in with whom and how often they collaborate? How, if all, does the diversity of their collaboration networks differ? Do certain types of collaborations generate higher quality research?
- What is distribution of female versus male researchers across different research fields? Are female researchers more active in certain fields? Do they focus on different topics?

Recommended Recurrence/Update

Annual update for up to 2 years (e.g., 3-year contract)
3. Additional Customizations

Naturally, we are open to discuss any possible adjustments to these analyses that you may require. Some examples might be:

- Different time period (default: most recent 5 years)
- Custom subject area mapping (default: ASJC). We can also offer OECD or NSF subject categories or even produce a customized mapping.
- Other comparator entities (default: institutions or countries)
  - Groups of institutions (e.g. AAU, U15, CIC, Ivy League)
  - Large Regions (e.g. Northeast, South, Midwest)
  - Cities/Metropolitan regions (e.g. Boston/Cambridge, Chicago, Montreal, metropolitan statistical areas (MSAs) for US or census metropolitan areas (CMAs) for CA)
- External data sources:
  - Publicly available sources (e.g. NSF NCSES, IPEDS, and BLS (US), HESA (UK), Statistics Canada, OECD, UNESCO, EuroStat, etc.)
  - Institution’s own data: we are fully capable of integrating your institution’s data to complement our analyses
- Stand-alone visualizations

This figure shows a heat map of global download shares for a particular university.

References

For more information about Analytical Services, please visit: elsevier.com/research-intelligence/analytical-services